UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
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NMFS Tracking
No.: 2003/00225

October 13, 2003

Thomas F. Mueller
Chief Regulatory Branch
Department of the Army
Seattle District Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Howisey and Dantzler Dock Project, Chelan County, Washington, WRIA 47 (COE No.: 1999-1-01770).

Dear Mr. Mueller:

Enclosed is a document containing a Biological Opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the proposed Howisey and Dantzler Dock Project, Chelan County, Washington, WRIA 47. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Upper Columbia River Spring (UCRS) chinook (*Oncorhynchus tshawytscha*) and/or Upper Columbia River (UCR) steelhead (*O. mykiss*). As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document contains a consultation on Essential Fish Habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for chinook and coho salmon. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days of receiving an EFH conservation recommendation.

If you have any questions, please contact Justin Yeager of the Washington State Habitat Branch Office at (509) 925-2618 or email at justin.yeager@noaa.gov.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

Enclosure

Endangered Species Act Section 7 Consultation Biological Opinion
and
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Howisey and Dantzler Dock Project
Upper Columbia River Spring Chinook
Upper Columbia River Steelhead
Columbia River
WRIA 47, Chelan County, Washington

Lead Action Agency:	U.S. Army Corps of Engineers
U.S. Army Corps of Engineers No.:	1999-1-01770
Consultation Conducted By:	National Marine Fisheries Service Northwest Region
Date Issued:	October 13, 2003

Issued by: For Michael R Crouse

D. Robert Lohn
Regional Administrator

NMFS Tracking No.: 2003/00225

TABLE OF CONTENTS

1.0 INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the NOAA's National Marine Fisheries Service (NOAA Fisheries) and United States Fish and Wildlife Service (together "the Services"), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations 50 CFR 402.

The analysis also fulfills the Essential Fish Habitat (EFH) consultation requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)).

The United States Army Corps of Engineers (COE) proposes to issue a permit for one residential overwater structure in the Columbia River. The COE is proposing the action according to its authority under section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and section 404 of the Clean Water Act (33 U.S.C. 1344).

1.1 Background and Consultation History

On March 10, 2003, NOAA Fisheries received a biological assessment (BA) and EFH assessment on the Howisey and Dantzler Dock project. On May 10, 2003 NOAA Fisheries sent a letter to the COE requesting additional information. On June 12, 2003 more information was received by NOAA Fisheries and formal consultation was initiated at that time. The consultation also included numerous telephone conversations and emails between NOAA Fisheries staff, the applicant, and the COE and are included in the administrative record. The administrative record for this consultation is on file at the Washington Habitat Branch office of NOAA Fisheries.

1.2 Proposed Action

Proposed actions are defined in the Services' consultation regulations (50 CFR 402.02) as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." Additionally, U.S. Code (16 U.S.C. 1855(b)(2)) further defines a Federal action as "any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken by a Federal agency." Because the COE proposes to issue permits that may affect listed resources, it must consult under ESA section 7(a)(2) and MSA section 305(b)(2).

The project to be authorized under the proposed permit includes the installation of a joint-use residential overwater structure consisting of a pier, ramp, and float. The pier will be "T" shaped, consisting of an elevated walkway section terminating in a floating moorage section. The 4-foot wide elevated walkway section will extend along the property line approximately 90 feet from the ordinary high water (OHW) line to a submerged railroad bed. A ramp will span the railroad bed to the float. The ramp will be 30 feet by 3 feet and fully grated. The float will be perpendicular to the ramp and will be 20 feet by 7 feet with 60% of the float grated. The pier would be supported by a concrete attachment pad above OHW and 18 8-inch diameter polyvinylchloride (PVC) encased concrete piles driven with a pneumatic jackhammer. Two additional piles will be driven on the river side of the railroad bed to anchor the float section.

1.3 Description of the Action Area

An action area is defined by the Services' regulations (50 CFR Part 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area affected by the proposed action starts at Rocky Reach Dam (River Mile (RM) 473.7) and extends upstream to Wells Dam (RM 515.8). The WRIAs encompassing the action area are 44, 46, 47, and 50. This area serves as a migratory corridor for juveniles and adults, it also includes rearing and holding areas for EFH and the salmonid Evolutionarily Significant Units (ESUs) listed in Table 1.

2.0 ENDANGERED SPECIES ACT - BIOLOGICAL OPINION

The objective of this Opinion is to determine whether the Howisey and Dantzler Dock Project is likely to jeopardize the continued existence of the Upper Columbia River Spring (UCRS) Chinook (*Oncorhynchus tshawytscha*) and/or Upper Columbia River (UCR) Steelhead (*O. mykiss*).

2.1 Evaluating the Effects of the Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA. In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps, (1) Consider the biological requirements and status of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species, and whether the action is consistent with any available recovery strategy; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species. If jeopardy is found, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy.

The fourth step above (jeopardy analysis) requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (*i.e.*, effects on habitat). The second part focuses on the species itself. It describes the action's effects on individual fish, populations, or both–and places those effects in the context of the ESU as a whole. Ultimately, the analysis seeks to determine whether the proposed action is likely to jeopardize a listed species' continued existence.

2.1.1 Biological Requirements

The first step NOAA Fisheries uses when applying ESA section 7(a)(2) to the listed ESUs considered in this Opinion includes defining the species' biological requirements within the action area. Biological requirements are population characteristics necessary for the listed ESUs to survive and recover to naturally-reproducing population sizes at which protection under the ESA would become unnecessary. The listed species' biological requirements may be described as characteristics of the habitat, population or both (McElhany *et al.* 2000).

The relevant biological requirements are those necessary for the listed species to survive and recover to naturally reproducing population levels at which time protection under the ESA would be unnecessary. Species or ESUs not requiring ESA protection have the following attributes: population sizes large enough to maintain genetic diversity and heterogeneity, the ability to adapt to and survive environmental variation, and are self-sustaining in the natural environment.

The UCRS chinook and UCR steelhead share similar basic biological requirements. These requirements include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence *et al.* 1996). The specific biological requirements affected by the proposed action include water quality, food, and unimpeded migratory access.

2.1.2 Status and Generalized Life History of Listed Species

In this step, NOAA Fisheries considers the current status of the listed species within the action area, taking into account population size, trends, distribution, and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species and also considers any new data that are relevant to the species' status.

The COE found that the Howisey and Dantzler Dock Project is likely to adversely affect the ESA-listed species identified in Table 2. Based on the life histories of these ESUs, the COE determined that it is likely that juveniles and smolts of these listed species would be adversely affected by the proposed action.

Table 2. References for additional background on listing status, critical habitat designation, protective regulations, and life history for the ESA-listed and candidate species considered in this consultation.

Species	Listing Status	Critical Habitat	Protective Regulations	Biological Information
Upper Columbia River spring-run chinook salmon	March 24, 1999; 64 FR 14308, Endangered	Not Designated[1]	July 10, 2000; 65 FR 42422	Myers *et al.*1998; Healey 1991
Upper Columbia River steelhead	August 18, 1997; 62 FR 43937, Endangered	Not Designated	July 10, 2000; 65 FR 42422	Busby *et al.*1995; 1996

2.1.2.1 Upper Columbia River Spring Chinook

The UCRS chinook salmon ESU, listed as endangered on March 24, 1999 (64 FR 14308), includes all natural-origin, stream-type chinook salmon from river reaches above Rock Island Dam and downstream of Chief Joseph Dam, including the Wenatchee, Entiat, and Methow River basins. All chinook in the Okanogan River are apparently ocean-type and are considered part of the UCR summer- and fall-run ESU. The spring-run components of the following hatchery stocks are also listed: Chiwawa, Methow, Twisp, Chewuch, and White rivers and Nason Creek. Critical habitat is not currently designated for UCRS chinook, although a designation may be forthcoming (see footnote 1). The UCRS chinook rear in the action area and are present during their smolt and adult migrations.

Geographic Boundaries and Spatial Distribution

The UCRS chinook salmon ESU, listed as endangered on March 24, 1999 (64 FR 14308), includes all natural-origin, stream-type chinook salmon found in Columbia River tributaries between the Rock Island and Chief Joseph Dams. NOAA Fisheries has initially identified three important spawning populations within this ESU: the Wenatchee, Entiat, and Methow populations (Interior Technical Recovery Team 2003). The populations are genetically and ecologically separate from the summer- and fall-run populations in the lower parts of many of the same river systems. Chinook salmon (and their progeny) from the following stocks that are raised in hatcheries are considered part of the listed ESU: Chiwawa River, Methow River, Twisp River, Chewuch River, White River, and Nason Creek. The UCRS chinook rear in the action area and are present during their smolt and adult migrations.

[1]Under development. On April 30, 2002, the U.S. District Court for the District of Columbia approved a NOAA Fisheries consent decree withdrawing a February 2000 Critical Habitat designation for this and 18 other ESUs.

Historical Information

The construction of Grand Coulee Dam (completed in 1942) blocked anadromous fish from habitat upstream of RM 596.6 after 1938. The concurrent Grand Coulee Fish Maintenance Project (GCFMP) influenced the present distribution of the ESU. Non-listed Carson-origin spring-run chinook salmon are also produced within the UCRS chinook salmon ESU. Non-listed spring-run chinook salmon hatchery populations contained within this ESU include Leavenworth, Entiat, and Winthrop national fish hatcheries.

Life History (including Ocean)

The UCRS chinook salmon exhibit classic stream-type life-history strategies: emigrating from freshwater as yearling smolts and undertaking extensive offshore ocean migrations. The majority of these fish mature at 4 years of age and return to the Columbia River from March through mid-May.

Population Trends and Risks

On April 4, 2002, NOAA Fisheries defined interim abundance recovery targets for each spawning aggregation in this ESU. These numbers are intended to represent the number and productivity of naturally produced spawners that may be needed for recovery, in the context of whatever take or mortality is occurring. They should not be considered in isolation, as they represent the numbers that, taken together, may be needed for the population to be self-sustaining in its natural ecosystem. For UCRS chinook salmon, the interim recovery levels are 3,750 spawners in the Wenatchee River, 500 spawners in the Entiat River, and 2,000 spawners in the Methow River.

All three of the existing UCRS chinook populations have exhibited similar trends and patterns in abundance over the past 40 years. The 1998 status review (Myers *et al.* 1998) reported that long-term trends in abundance were generally negative, ranging from minus 5% to plus 1%. Analyses of the data series, updated to include 1996-2001 returns, indicate that those trends have continued. Based on redd count data series, spawning escapements for the Wenatchee, Entiat, and Methow rivers have declined an average of 5.6%, 4.8%, and 6.3% per year, respectively, since 1958. In the most recent 5-year geometric mean (1997-2001), spawning escapements were 273 for the Wenatchee population, 65 for the Entiat population, and 282 for the Methow population, only 8% to 15% of the interim abundance recovery targets, although escapement increased substantially in 2000 and 2001 in all three river systems. Based on 1980-2000 returns, the average annual growth rate for this ESU is estimated as 0.85. Assuming that population growth rates were to continue at 1980-2000 levels, UCRS chinook salmon populations are projected to have very high probabilities of 90% decline within 50 years (87% to 100%).

2.1.2.2 Upper Columbia River Steelhead

The UCR steelhead ESU, listed as endangered on August 18, 1997 (62 FR 43937), includes all natural-origin populations of steelhead in the Columbia River basin upstream from the Yakima River in Washington, to the U.S./Canada border. The Wells Hatchery stock is included among the listed populations. Critical habitat is not presently designated for UCR steelhead, although a designation may be forthcoming (see footnote 1, page 4).

Geographic Boundaries and Spatial Distribution

The UCR steelhead ESU, listed as endangered on August 18, 1997 (62 FR 43937), includes all naturally spawned populations of steelhead (and their progeny) in streams adjacent to the mainstem Columbia River upstream of the confluence of the Yakima River to the tailrace of Chief Joseph Dam. NOAA Fisheries has initially identified three important spawning populations within this ESU: the Wenatchee, Entiat, and Methow populations (Interior Technical Recovery Team 2003). Wells Hatchery steelhead stock are also currently part of the listed ESU. UCR steelhead rear in the action area and are present during their smolt and adult migrations.

Historical Information

Steelhead are not thought to have occurred in large numbers in British Columbia, Canada, in the upper Columbia River basin. Estimates of historical (pre-1960s) abundance specific to this ESU are available from fish counts at dams. Counts at Rock Island Dam from 1933 to 1959 averaged 2,600 to 3,700, suggesting a pre-fishery run size exceeding 5,000 adults for tributaries above Rock Island Dam. Runs may already have been depressed, however, by lower Columbia River fisheries and other habitat degradation problems in the natal tributaries. Grand Coulee Dam blocked anadromous fish from habitat upstream of RM 596.6 after 1938. The concurrent GCFMP also influenced the present distribution of the ESU. In 1961, the Chief Joseph Dam also blocked anadromous fish from remaining habitat upstream of RM 545.1.

Life History

Life history characteristics for UCR steelhead are similar to those of other inland steelhead ESUs; however, smolt age is dominated by 2- and 3-year-olds and some of the oldest smolt ages for steelhead, up to 7 years, are reported from this ESU (Peven 1990). Based on limited data, steelhead from the Wenatchee and Entiat rivers return to freshwater after one year in salt water, whereas Methow River steelhead primarily return after two years in salt water. Similar to other inland Columbia River basin steelhead ESUs, adults typically return to the Columbia River between May and October and are considered summer-run steelhead. Adults may remain in freshwater up to a year before spawning. Unlike chinook salmon or sockeye salmon, a fraction of steelhead adults attempt to migrate back to the ocean. These fish are known as kelts, and those that survive will migrate from the ocean to their natal stream to spawn again.

Population Trends and Risks

On April 4, 2002, NOAA Fisheries defined interim abundance recovery targets for each spawning population in this ESU (Lohn 2002). These targets are intended to represent the number and productivity of naturally produced spawners that may be needed for recovery, in the context of whatever take or mortality is occurring. They should not be considered in isolation, as they represent the numbers that, taken together, may be needed for the population to be self-sustaining in its natural ecosystem. For UCR steelhead, the interim recovery levels are 2,500 spawners in the Wenatchee River, 500 spawners in the Entiat River, and 2,500 spawners in the Methow River (Lohn 2002).

Returns of both hatchery and naturally produced steelhead to the upper Columbia River have increased in recent years. The average 1997-2001 return counted through the Priest Rapids fish ladder was approximately 12,900 fish. The average for the previous five years (1992-1996) was 7,800 fish. Abundance estimates of returning naturally produced UCR steelhead have been based on extrapolations from mainstem dam counts and associated sampling information (e.g., hatchery/wild fraction, age composition). The natural component of the annual steelhead run over Priest Rapids Dam increased from an average of 1,040 (1992-1996), representing about 10% of the total adult count, to 2,200 (1997-2001), representing about 17% of the adult count during this period of time (West Coast Salmon BRT 2003).

In terms of natural production, recent population abundances for both the Wenatchee/Entiat river aggregate population and the Methow population remain well below the interim recovery levels developed for these populations (West Coast Salmon BRT 2003). A 5-year geometric mean (1997-2001) of approximately 900 naturally produced steelhead returned to the Wenatchee and Entiat rivers (combined) compared to a combined abundance target of 3,000 fish. Although this is well below the interim recovery target, it represents an improvement over the past (an increasing trend of 3.4% per year). However, the average percentage of natural fish for the recent 5-year period dropped from 35% to 29%, compared to the previous status review. For the Methow population, the 5-year geometric mean of natural returns over Wells Dam was 358. Although this is well below the interim recovery target, it represents an improvement over the past (an increasing trend of 5.9% per year). In addition, the estimated 2001 return (1,380 naturally produced spawners) was the highest single annual return in the 25-year data series. However, the average percentage of wild origin spawners dropped from 19% for the period prior to the 1998 status review to 9% for the 1997 to 2001 returns.

2.1.3 Environmental Baseline in the Action Area

The environmental baseline is defined as: "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of state and private actions that are contemporaneous with the consultation in progress" (50 CFR 402.02). NOAA Fisheries' evaluates the relevance of the environmental baseline in the action area to the species' current status. In describing the environmental baseline, NOAA Fisheries evaluates essential features of designated critical habitat, if designated, and the listed Pacific salmon ESUs affected by the proposed action.

In general, the environment for listed species in the Columbia River Basin (CRB), including those that migrate past or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams have eliminated mainstem spawning and rearing habitat, and have altered the natural flow regime of the Columbia River, decreasing spring and summer flows, increasing fall and winter flow, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The nine dams in the migration corridor of the Columbia River kill or injure a portion of the smolts passing through the area. The low velocity movement of water through the reservoirs behind the dams slows the smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996, National Research Council 1996). Formerly complex mainstem habitats in the Columbia River have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; and Coutant 1999). The amount of large woody debris in these rivers has declined, reducing habitat complexity and altering the rivers' food webs (Maser and Sedell 1994).

Other human activities that have degraded aquatic habitats or affected native fish populations in the CRB include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads (many with impassable culverts), timber harvest, splash dams, mining, water withdrawals, unscreened water diversions, agriculture, livestock grazing, urbanization, outdoor recreation, fire exclusion/suppression, artificial fish propagation, fish harvest, and introduction of non-native species (Henjum *et al.* 1994; Rhodes *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997). In many watersheds, land management and development activities have: (1) reduced connectivity (*i.e.*, the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields, degrading spawning and rearing habitat; (3) reduced large woody material that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced vegetative canopy that minimizes solar heating of streams; (5) caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; and (7) altered floodplain function, water tables and base flows (Henjum *et al.* 1994; McIntosh *et al.* 1994; Rhodes *et al.* 1994; Wissmar *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997).

The action area consists of the impoundment of the Columbia River behind Rocky Reach Dam. The Rocky Reach Reservoir (Lake Entiat) extends 41 miles upstream to the tailrace of Wells Dam. Lake Entiat has a surface area of 8,167 acres, a volume of 431,500 acre-feet, an average depth of 42 feet, and a shoreline length of 93 miles. The Entiat and Chelan Rivers are the major tributaries flowing into the Reservoir. Lake Entiat forms the downstream boundary of WRIAs

44, 45, 46, 47, and 50. A broad river valley surrounds the dam and land use adjacent to the dam mainly includes apple orchards that line both sides of the Columbia River. There are also private residences, a residential subdivision, some commercial uses, and Lincoln Rock State Park. As part of its license to operate Rocky Reach Dam, Chelan Public Utility District was required to develop parks and recreation areas. State and federally owned lands are also located in the vicinity of Rocky Reach Dam. Most of the land located east of the dam is privately owned, except for some interspersed Federal public lands that are managed by the BLM.

To address problems inhibiting salmonid recovery in CRB tributaries, the Federal resource and land management agencies developed the “All H” Strategy (Federal Caucus 2000). Components of the “All H” Strategy commit these agencies to increased coordination and a fast start on protecting and restoring tributary and mainstem habitats.

Pacific salmon populations also are substantially affected by variation in the freshwater and marine environments. Ocean conditions are a key factor in the productivity of Pacific salmon populations. Stochastic events in freshwater (flooding, drought, snowpack conditions, volcanic eruptions, etc.) can play an important role in a species’ survival and recovery, but those effects tend to be localized compared to the effects associated with the ocean. The survival and recovery of these species depends on their ability to persist through periods of low natural survival due to ocean conditions, climatic conditions, and other conditions outside the action area. Freshwater survival is particularly important during these periods because enough smolts must be produced so that a sufficient number of adults can survive to complete their oceanic migration, return to spawn, and perpetuate the species.

2.2 Analysis of Effects

Effects of the action are defined as: "the direct and indirect effects of an action on the species, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline" (50 CFR 402.02). Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing the value of habitat for meeting the species’ biological requirements. Indirect effects are defined in 50 CFR 402.02 as “those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.” They include the effects on listed species of future activities that are induced by the proposed action and that occur after the action is completed. “Interrelated actions are those that are part of a larger action and depend on the larger action for their justification” (50 CFR 403.02). “Interdependent actions are those that have no independent utility apart from the action under consideration” (50 CFR 402.02).

2.2.1 Habitat and Species Effects

NOAA Fisheries will consider any scientifically credible framework for determining an activity’s effect. To streamline the consultation process and acheive consistency in effects determinations across agencies, NOAA Fisheries suggests agencies use the Matrix of Pathways and Indicators from NMFS (1996), where appropriate. The matrix enables characterization of existing environmental conditions in a way that the effects of actions can be assessed for their relationship to conservation of the affected species. Specifically, if a proposed action is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward Properly Functioning Condition (PFC), it might not be found consistent with conserving the species, depending on the relationship of the effects on the population dynamics of the affected species.

For the streams typically considered in salmon habitat-related consultations, a watershed is a logical unit for analysis of potential effects of an action (particularly for actions that are large in scope or scale). Healthy salmonid populations use habitats throughout watersheds (Naiman *et al.* 1992), and riverine conditions reflect biological, geological, and hydrological processes operating at the watershed level (Nehlsen *et al.* 1997; Bisson *et al.* 1997; and NMFS 1999). Although NOAA Fisheries prefers watershed-scale consultations for greater efficiency in reviewing multiple actions, increased analytic ability, and the potential for more flexibility in management practices, often it must analyze effects at geographic areas smaller than a watershed or basin due to a proposed action's scope or geographic scale. Analyses that are focused at the scale of the site or stream reach may not be able to discern whether the effects of the proposed action will contribute to or be compounded by the aggregate of watershed impacts. This loss of analytic ability typically should be offset by more risk averse proposed actions and analyses (NMFS 1999).

2.2.1.1 Direct Effects

Direct effects are the immediate effects of the project on the species or its habitat. Direct effects result from the agency action and include the effects of interrelated and interdependent actions. Future Federal actions that are not interrelated or interdependent with the action under consideration are not evaluated (USFWS and NMFS 1998).

2.2.1.1.1 Turbidity. The proposed action includes permitting construction in and near the water. Such construction can mobilize sediments and temporarily increase local turbidity levels in the Columbia River. In the immediate vicinity of construction (several meters), the level of turbidity would likely exceed natural background levels and affect fish. The proposed action includes measures to decrease the likelihood and extent of any such affect on listed salmonids. These measure include timing restrictions and construction Best Management Practices (BMPs).

Quantifying turbidity levels, and their effect on fish species is complicated by several factors. First, turbidity from an activity will typically decrease as distance from the activity increases. How quickly turbidity levels attenuate is dependent upon the quantity of materials in suspension (*e.g.*, mass or volume), the particle size of suspended sediments, the amount and velocity of ambient water (dilution factor), and the physical/chemical properties of the sediments. Second, the impact of turbidity on fish is not only related to the turbidity levels, but also the particle size of the suspended sediments.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (*i.e.*, gill flaring, coughing, avoidance, increase in blood sugar levels) which indicate some level of stress (Bisson and Bilby 1982; Sigler *et al.* 1984; Berg and Northcote 1985; Servizi and Martens 1992). The magnitude of these stress responses are generally higher when turbidity is increased and particle size decreased (Bisson and Bilby 1982; Servizi and Martens 1987; Gregory and Northcote 1993). Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity (35-150 nephelometric turbidity units [NTUs]) accelerate foraging rates among juvenile chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect).

It is expected that turbidity arising from the project will be short-lived and have a low potential for causing take. The project includes measures to reduce or avoid turbidity impacts. Installation will occur when listed species are least likely to be present near the project site, minimizing the potential for adverse effects. Those fish that are present in the construction area when the effects are manifest are likely to be able to avoid the area until the effects dissipate.

2.2.1.1.2 Percussive Damage (Pile Driving). The proposed action includes driving piles with a vibratory pile driver, pneumatic jackhammer, or sledgehammer. When driving steel piles, impact hammers produce intense, sharp spikes of sound which can reach levels that harm or even kill fishes (*e.g.*, FRPD Ltd. 2001; Washington State Ferries 2001; NMFS 2002; J. Stadler, NMFS, pers. comm. 2002). The extent to which the noise will disturb fish is related to the distance between the sound source and affected fish and by the duration and intensity of pile driving. The type and intensity of the sounds produced during pile driving depend on a variety of factors, including, but not limited to, pile type and size, the firmness of the substrate into which the pile is being driven, water depth, and the type and size of the pile-driving hammer. The proposed action includes measures to decrease the likelihood and extent of any such affect on listed salmonids. These measure include timing restrictions, pile driver limitations, and construction BMPs.

Fishes may respond to the first few strikes of an impact hammer with a "startle" response. After these initial strikes, the startle response wanes and the fishes may remain within the field of a potentially-harmful sound (Sonalysts Inc. 1997; NMFS 2002). To elicit an avoidance response, a sound must be in the infrasound range (less than 20 Hz) and the fish must be exposed to the sound for several seconds (Enger *et al.* 1993; Knudsen *et al.* 1994; Sand *et al.* 2000). Such sounds are similar to those produced when piles are driven with a vibratory hammer. Impact hammers, however, produce such short spikes of sound with little energy in the infrasound range that avoidance is not elicited (Carlson *et al.* 2001). Thus, impact hammers may be harmful for two reasons: they produce more intense pressure waves and the sounds produced do not elicit an avoidance response in fishes, leading to exposure for longer periods to those harmful pressures.

The effects of pile driving sound on fishes depends on several factors, including the sound pressure levels (SPL) being transmitted and the size and species of fish. There is little data on the SPL required to cause harm to fishes. Carlson *et al.* (2001) reported that impact driving of 12-inch diameter wood piles produced peak SPLs up to 195 decibels (dB) (re: 1µPa). Short-term exposure to SPLs above 180 dB (re: 1μPa) are thought to inflict physical harm on fishes (Hastings 1995, cited in NMFS 2002). Based on the known range of hearing for salmon, Feist *et al.* (1992) suggested that the sounds of impact driving of concrete piles were audible to salmon up to 600 meters from the pile driver, and that salmonids in close proximity (less than 10 meters) to pile driving may experience temporary or permanent hearing loss.

Growing evidence of the effects of pile driving has been gathered in the Pacific Northwest. Throughout the study of pile driving effects on juvenile salmonids, Feist (1991) found that pile installation operations affected the distribution and behavior of fish around the site. For example, the abundance of fish during non-pile driving days was two fold greater than on days when pile driving occurred. Additionally, salmonids were less responsive to the activity of observers on the shore during pile driving than during periods without pile driving. This reduced responsiveness may put them at greater risk of predation.

On several occasions, fish mortality and/or fish distress has been observed during installation of steel piles using impact hammers. At the Mukilteo ferry dock, during impact hammer installation of 24-inch and 30-inch diameter steel pilings, juvenile striped surfperch (*Embiotoca lateralis*) floated to the surface and were immediately eaten by birds (Washington State Ferries 2001). The Department of Fisheries and Oceans Canada related that mortality of juvenile salmon, perch, and herring occurred during impact driving of 36-inch steel piles at the Canada Place Cruise Ship Terminal in Vancouver, British Columbia. More recently, a number of shiner perch (*Cymatogaster aggregata*) and striped surfperch were killed during impact driving of 30-inch diameter steel pilings at the Winslow Ferry Terminal in Washington, (J. Stadler, NMFS, pers. comm. 2002). Most of the dead fishes were the smaller *C. aggregata* and similar sized specimens of *E. lateralis*, even though many larger *E. lateralis* were in the same area. Dissections revealed that the swimbladder of the smallest of the fishes (80 mm fork length [FL]) were completely destroyed, while that of the largest individual (170 mm FL) was nearly intact, indicating a size-dependent effect. The sound pressure levels that killed these fishes are not yet known. Of the reported fish-kills associated with pile driving, all have occurred during use of an impact hammer (*e.g.*, FRPD Ltd. 2001; Washington State Ferries 2001; NMFS 2002; J. Stadler, NMFS, pers. comm. 2002).

Research and field observations show that effects associated with pile driving can range from disruption of schooling behavior to fish death. If pile driving equipment is used, in-water operations will only occur between July 1and February 28 in the year(s) during which the project receives permit(s). Restricting in-water operations to this time period minimizes the potential for adverse effects to juvenile chinook and steelhead because juveniles are least likely to be present in the action area during this work-window. In addition, pilings will only be driven by a vibratory pile driver, pneumatic jackhammer, or sledgehammer. By using any of these, the noise produced should be greatly reduced over an impact pile driver and thus minimize the negative effects to listed fish.

2.2.1.1.3 Lost Benthic Habitat. The footprint of the proposed action will result in the loss of a maximum of seven square feet of benthic habitat in the Columbia River. Removal of benthic habitat can reduce invertebrate species and their habitat. Aquatic invertebrates are an important food item of juvenile salmonids. Therefore, removal of benthic habitat could reduce aquatic invertebrates, thus reducing a food source for juvenile and adult salmonids.

Benthic habitats provide forage, cover, and breeding opportunities for riverine fishes (Allan 1995; Waters 1995; Stanford *et al.* 1996). Juvenile salmonids are opportunistic predators that eat a wide variety of invertebrate species. They generally feed on drifting invertebrates in streams although they are also known to forage on epibenthic prey on the stream bottom. Aquatic invertebrates can recolonize disturbed locations quickly and adapt to new features in their environment. Therefore, given the small footprint of the lost benthic habitat relative to the total benthic habitat in the action area and the fast invertebrate recolonization rate, the effects to listed fish should be limited to the direct loss of seven square feet of benthic habitat.

2.2.1.2 Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action. Indirect effects might include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. These actions must be reasonably certain to occur, or be a logical extension of the proposed action.

2.2.1.2.1 Predation. Residential boat docks add both in- and overwater structure. Adding in-water structures and decking can create beneficial structure for fish species that prey on juvenile salmonids. Therefore, predation on listed salmonids could increase as a result of the residential dock. However, the project includes measures (including grating and reflective dock components) to decrease the likelihood and extent of any such effects to listed salmonids.

Native (*e.g.*, northern pikeminnow (*Ptychocheilus oregonensis*)) and non-native (*e.g.*, smallmouth bass (*Micropterus dolomieu*), black crappie (*Pomoxis nigromaculatus*), white crappie (*Pomoxis. annularis*), and yellow perch (*Perca flavescens*)) piscine predators are year-round residents of the Columbia River reservoirs and are also known to consume salmonids. While NOAA Fisheries is not aware of any studies which have been done to specifically determine impacts of in- and overwater structures in the Columbia River system on listed salmonids, numerous analogous predation studies suggest that serious predation impacts from these emplacements could occur. Increased predation impacts are a function of increased predation rates on listed salmonids, as well as increased predator populations from introduced artificial habitat that imparts rearing and ambush habitat for native and non-native predator species.

Four major predatory strategies are utilized by piscivorous fish: prey pursuit, prey ambush, prey habituation to a non-aggressive illusion, or prey stalking (Hobson 1979). Ambush predation is probably the most commonly employed predation strategy. Predators lie-in-wait, then dart out at prey in an explosive rush (Gerking 1994). Oftentimes, predators use sheltered areas that provide velocity shadows to ambush prey fish in faster currents (Bell 1991). The addition of 20 pilings to the action area will provide 20 velocity shadows of unknown size that expand and contract as discharge changes. These velocity shadow areas will likely be used by predators waiting to ambush migrating salmonid smolts.

In addition, light plays an important role in both predation success and prey defense mechanisms. Prey species are better able to see predators under high light intensity, thus providing the prey species with a relative advantage (Hobson 1979). Petersen and Gadomski (1994) found that predator success was higher at lower light intensities. Prey fish lose their ability to school at low light intensities, making them vulnerable to predation (Petersen and Gadomski 1994). Howick and O'Brien (1983) found that under high light intensities, prey species (bluegill (*Lepomis macrochirus*)) can locate largemouth bass (*Micropterus salmoides*) before they are seen by the bass. However, under low light intensities, bass can locate the prey before they are seen. Walters *et al.* (1991) indicate that high light intensities may result in increased use of shade-producing structures by predators, while Bell (1991) states that "light and shadow paths are utilized by predators advantageously."

In- and overwater structures create light/dark interface conditions (*i.e.,* shadows) that allow ambush predators to remain in darkened areas (barely visible to prey) and watch for prey to swim by against a bright background (high visibility). Prey species moving around structure(s) are unable to see predators in dark areas under or beside structure(s) and are more susceptible to predation. Juvenile salmonids, especially ocean type chinook (among others), may utilize backwater areas during their outmigration (Parente and Smith 1981). The presence of predators may force smaller prey fish species into less desirable habitats, disrupting foraging behavior, and depressing growth (Dunsmoor *et al.* 1991). Bevelhimer (1996), in studies on smallmouth bass, indicates that ambush cover and low light intensities create a predation advantage for predators and can also increase foraging efficiency. Ward (1992) found that stomachs of pikeminnow in developed areas of Portland Harbor contained 30% more salmonids than those in undeveloped areas, although undeveloped areas contained more pikeminnows. To minimize the light/dark interface on salmonids the applicant will utilize conservative dock design criteria. Surfacing, at a minimum, 60% of the float and 100% of the pier and ramp will reduce the overall light/dark interfaces that would be produced by using opaque materials. In addition, the float and pilings will be a white color allowing some reflection of light, further reducing the light/dark interface. However, using conservative dock design criteria does not eliminate the light/dark interfaces it only reduces the area impacted or shaded by dock structures in an attempt to maintain more natural light conditions.

Literature and anecdotal evidence substantiate the use of docks and other structures by juvenile predators for rearing purposes. Juvenile predators may derive a survival advantage from use of these structures by avoiding predation by their larger conspecifics (Hoff 1991; Carrasquero 2001). In addition, smallmouth bass have been observed to preferentially locate nest sites near artificial structures (Pflug and Pauley 1984; Hoff 1991). Hoff (1991) documents increases of successful smallmouth bass nests of 183% to 443% and increases in catch/effort for fingerlings of 60% to

3,840% in Wisconsin lakes after the installation of half-log structures, concluding that increasing nesting cover in lakes with low nest densities, poor quality and/or quantity of nesting cover, and low first-year recruitment rates can significantly increase recruitment. The proposed action will add new in- and overwater structure which may benefit predators by providing cover and nesting locations for predators. In addition, the pilings themselves could provide nesting and therefore spawning locations for predator species. By increasing the number of predators, there is the potential to increase the predation pressure on listed salmonids in the action area. To minimize the effects to listed salmonids, the applicant will use conservative dock design criteria (grating and reflective materials). However, the proposed action is still likely to increase rearing and spawning habitat for predators, which may improve spawning success and lead to an overall predator population increase in the action area.

Native predators such as northern pikeminnow, and introduced predators such as smallmouth bass, black crappie, white crappie, and potentially, yellow perch (Ward *et al.* 1994; Poe *et al.* 1991; Beamesderfer and Rieman 1991; Rieman and Beamesderfer 1991; Petersen *et al.* 1990; Pflug and Pauley 1984; Collis *et al.* 1995) likely utilize habitat created by in- and overwater structures (Ward and Nigro 1992; Pflug and Pauley 1984). The proposed action will add velocity and light shadow areas for piscine predators. UCRS chinook and UCR steelhead use the action area for migratory purposes, and some individuals may actually rear throughout the area. The extent of increase in predation on salmonids in the Columbia River resulting from overwater structures is not well known. Further, salmon stocks with already low abundance are susceptible to further depression by predation (Larkin 1979).

In addition to piscivorous predation, in-water structures (tops of pilings) also provide perching platforms for avian predators such as double-crested cormorants (*Phalacrocorax auritis*) (Kahler *et al.* 2000), from which they can launch feeding forays or dry plumage. Placement of pilings to support the dock structures will potentially provide some usage by cormorants. However, placement of anti-perching devices on the top of the pilings should minimize the extent to which the dock conveys an advantage to avian predators.

Based on the presence of salmonids and native and non-native predators in the action area, and the additional shading and vertical structure created by the installation of new docks, it appears likely that the proposed action will contribute to increased predation rates on listed juvenile salmonids. Further, the pilings will create spawning and rearing habitats that could increase predator populations by the addition of in-water structure and overwater structure. Using the best available science, it is impractical at this time to quantify the number of listed salmonids that will be lost to predation as a consequence of the proposed action. However, when added to the environmental baseline, advantageous predator habitat created by this proposed action will likely result in only a minor increase in predation rates on listed salmonids.

2.2.1.2.2 Littoral Productivity. Docks can negatively affect littoral productivity. The shade that docks creates can inhibit the growth of aquatic macrophytes and other plant life (*e.g.*, epibenthic algae and pelagic phytoplankton). The proposed residential dock will add in- and overwater structure. However, the project includes measures (*i.e.*, grating and reflective dock components) to decrease the likelihood and extent of any such effects on listed salmonids.

Aquatic plant life is the foundation for most aquatic food webs and their presence or absence affects many higher trophic levels (*e.g.*, invertebrates and fishes). Autochthonous pathways are of overriding importance in the trophic support of juvenile salmonids (Murphy 1991). In large rivers, autotrophs are more abundant nearer the shore (Naiman *et al.* 1980). Consequently, the shade from docks can affect local plant/animal community structure or species diversity. At a minimum, shade from docks can affect the overall productivity of littoral environments (Kahler *et al.* 2000).

The proposed action includes measures to reduce the likelihood and extent of effects from this activity by incorporating conservative dock design criteria. Surfacing 60% of the float deck and 100% of the ramp and pier with grating or translucent material and using reflective materials for in-water components is expected to result in more natural light conditions beneath the proposed structures than would result from using traditional materials. Furthermore, given the small footprint of the dock relative to the total surface area of littoral habitat in the action area, it is unlikely that primary productivity will be reduced to an extent that affects fish.

2.2.1.2.3 Boating Activity. Adding new docks may increase levels of boating activity in the reservoirs, especially near the docks. Although the type and extent of boating activity that might be enhanced by the proposed action are outside of the discretionary action under consultation here, boating activity might cause several impacts on listed salmonids and aquatic habitat. Engine noise, prop movement, and the physical presence of boat hulls may disturb or displace nearby fishes (Mueller 1980; Warrington 1999).

Boat traffic could also cause increased turbidity in shallow waters, uproot aquatic macrophytes in shallow waters, aquatic pollution (through exhaust, fuel spills, or release of petroleum lubricants), and shoreline erosion. These boating impacts indirectly affect listed fish in a number of ways. Turbidity may injure or stress affected fishes, as discussed in more detail in section 2.2.1.1.1. The loss of aquatic macrophytes may expose salmonids to predation, decrease littoral productivity, or alter local species assemblages and trophic interactions. Despite a general lack of data specifically for salmonids, pollution from boats may cause short-term injury, physiological stress, decreased reproductive success, cancer, or death for fishes in general. Further, pollution may also impact fishes by impacts to potential prey species or aquatic vegetation.

The new dock is likely to cause a small increase in capacity in the Rocky Reach Reservoir. Therefore, this should only lead to a slight increase in boat use and therefore a negligible effect on listed salmonids.

2.2.2. Population Scale Effects

As detailed in Section 2.1.2, NOAA Fisheries has estimated the median population growth rate (lambda) for each species affected by this project. Under the environmental baseline, life history diversity has been limited by the influence of hatchery fish, by physical barriers that prevent migration to historical spawning and/or rearing areas, and by water temperature barriers that influence the timing of emergence, juvenile growth rates, or the timing of upstream or downstream migration. In addition, hydropower development has profoundly altered the riverine environment and those habitats vital to the survival and recovery of the ESUs that are the subject of this consultation.

The Howisey and Dantzler Dock Project is expected to add temporary, construction-related effects to the existing environmental baseline. Further, NOAA Fisheries believes that long-term, minor increases in predation rates and predator populations will occur as well. However, these effects, as detailed above, are not expected to have any significance at the population level. Therefore, NOAA Fisheries believes that the proposed action does not contain measures that are likely to influence population trends of the affected ESU.

2.2.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." These activities within the action area also have the potential to adversely affect the listed species. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being reviewed through separate section 7 consultation processes. Federal actions that have already undergone section 7 consultations have been added to the description of the environmental baseline in the action area.

State, tribal, and local government actions will likely be in the form of legislation, administrative rules or policy initiatives. Government and private actions may encompass changes in land and water uses – including ownership and intensity – any of which could adversely affect listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties.

Changes in the economy have occurred in the last 15 years, and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector, is creating urbanization pressures and increased demands for buildable land, electricity, water supplies, waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement, and this trend is likely to continue. Such population trends will result in greater demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The result of these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative, unless carefully planned for and avoided or mitigated.

Agricultural activities are the main land use in the action area Riparian buffers are not properly functioning, containing little woody vegetation. Although land use practices that would result in take of endangered species is prohibited by section 9 of the ESA, such actions do occur. NOAA Fisheries cannot conclude with certainty that any particular riparian habitat will be modified to such an extent that take will occur. Riparian habitat is essential to salmonids in providing and maintaining various stream characteristics such as; channel stabilization and morphology, leaf litter, and shade. However, given the patterns of riparian development in the action area and rapid human population growth of Chelan County (27.5% from 1990-2000, U.S. Census Bureau), it is reasonably certain that some riparian habitat will be impacted in the future by non-Federal activities.

The state of Washington has various strategies and programs designed to improve the habitat of listed species and assist in recovery planning. Washington's 1998 Salmon Recovery Planning Act provided the framework for developing watershed restoration projects and established a funding mechanism for local habitat restoration projects. The Watershed Planning Act, also passed in 1998, encourages voluntary planning by local governments, citizens, and Tribes for water supply and use, water quality, and habitat at the Water Resource Inventory Area or multi-Water Resource Inventory Area level. Washington's Department of Fish and Wildlife and tribal co-managers have been implementing the Wild Stock Recovery Initiative since 1992. The co-managers are completing comprehensive species management plans that examine limiting factors and identify needed habitat activities. Water quality improvements will be proposed through development of Total Maximum Daily Loads (TMDLs). The state of Washington is under a court order to develop TMDL management plans on each of its 303(d) water-quality-listed streams. It has developed a schedule that is updated yearly; the schedule outlines the priority and timing of TMDL plan development. These efforts should help improve habitat for listed species. Washington State closed the mainstem Columbia River to new water rights appropriations in 1995, but lifted this moratorium in 2002. The state has proposed to mitigate the effects of new appropriation by purchasing or leasing replacement water when Columbia River flow targets are not met. The efficacy of this program is unknown at the present time.

2.3 Conclusion

NOAA Fisheries has reviewed the direct, indirect, and cumulative effects of the proposed action on the above listed species and their habitat. NOAA Fisheries evaluated these effects in light of existing conditions in the action area and the measures included in the action to minimize the effects. The proposed action is likely to cause short-term adverse effects on listed salmonids by modifying habitat and construction activities. In addition, the proposed action is likely to cause long-term adverse effects on listed salmon by increasing predation. These effects are unlikely to reduce salmonid distribution, reproduction, or numbers in any meaningful way. Consequently, the proposed action is not likely to jeopardize the continued existence of listed UCRS chinook and/or UCR steelhead.

2.4 Conservation Recommendations

Conservation recommendations are defined as "discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or regarding the development of information" (50 CFR 402.02). Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. NOAA Fisheries has no conservation recommendation to make at this time.

2.5 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required if: 1) The amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; 2) new information reveals effects of the action may affect listed species in a way not previously considered; 3) the action is modified in a way that causes an effect on listed species that was not previously considered; or 4) a new species is listed that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending conclusion of the reinitiated consultation.

2.6 Incidental Take Statement

The ESA at section 9 (16 U.S.C. 1538) prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule (50 CFR 223.203). Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. 1532(19)). Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." (50 CFR 222.102) Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering" (50 CFR 17.3). Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant" (50 CFR 402.02). The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement (16 U.S.C. 1536).

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.6.1 Amount or Extent of Take

As stated in section 2.1.2, above, UCRS chinook and UCR steelhead use the action area for migratory purposes and possibly rearing. The UCR steelhead are likely to be present in the action area any day of the year. The UCRS chinook are likely to be present in the action area during part of the year such that they will likely encounter some of the effects of the proposed action. Therefore, incidental take of these listed fish is reasonably certain to occur. The proposed action includes measures to reduce the likelihood and amount of incidental take. To ensure the action agency will implement these measures, take minimization measures included as part of the proposed action are restated in the Terms and Conditions provided below.

Take caused by the proposed action is likely in the form of harm, where habitat modifications will impair normal behavior patterns of listed salmonids. Harm is likely to result from increased predation because of the construction of the proposed dock. The amount or extent of take is difficult, if not impossible to estimate. In instances where the number of individual animals to be taken cannot be reasonably estimated, NOAA Fisheries uses a surrogate approach. The surrogate should provide an obvious threshold of authorized take which, if exceeded, provides a basis for reinitiating consultation.

This Opinion analyzes the extent of effects that will result from adding a dock in the Rocky Reach Reservoir. The total overwater structure is 590 square feet. The pier and ramp will be fully grated so their impact on fish should be minimized to the greatest extent possible. There will also be 20 in-water pilings with a diameter of 8 inches. The pilings will amount to a maximum reduction of 7 square feet of benthic habitat. Despite the use of the best scientific and commercial data available, NOAA Fisheries cannot estimate the number of fish that will be injured or killed by these occurrences. Therefore, the extent of take anticipated in this statement is that which will occur from the addition of up to 20, 8-inch piling, 590 square feet of additional overwater structure, and displacing 7 square feet of benthic habitat. Should any of these thresholds be exceeded during project activities, the reinitiation provisions of this Opinion apply.

2.6.2 Reasonable and Prudent Measures

Reasonable and Prudent Measures are non-discretionary measures to minimize take, that may or may not already be part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(o)(2) to apply. The COE has the continuing duty to regulate the activities covered in this incidental take statement. If the COE fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. NOAA Fisheries believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further consultation.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of listed fish resulting from implementation of the action.

The COE shall:

1. Minimize incidental take from administration of the regulatory program for Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899, as covered in the proposed Howisey and Dantzler Dock Project .

2. Minimize incidental take from general construction.

3. Minimize incidental take from in- and overwater structures.

2.6.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the action must be implemented in compliance with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure No. 1, (Howisey and Dantzler Dock Project) the COE shall ensure each of the following elements:

    a. Full implementation required. Departure from full implementation of the terms and conditions of the following incidental take statement will result in the lapse of the protective coverage of section 7(o)(2) regarding 'take' of listed species and may lead NOAA Fisheries to a different conclusion as to the effects of the continuing action, including findings that specific projects will jeopardize listed species.

    b. Project access. Require landowners to provide reasonable access[2] to projects permitted under this Opinion for monitoring the use and effectiveness of permit conditions.

    c. Salvage Notice. Include the following notice with each permit issued, or in writing to each party that will supervise completion of the action.

    NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Northwest Office of NOAA Fisheries Law Enforcement at (206) 526-6133. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material

[2]'Reasonable access' means with prior notice to the applicant, the COE and NOAA Fisheries may at reasonable times and in a safe manner, enter and inspect permitted projects to insure compliance with the reasonable and prudent measures, terms and conditions, in this Opinion.

in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

d. Mitigation projects. Ensure that the applicant or COE project successfully completes site restoration and mitigation for long-term adverse effects (in any) by requirement of one mitigation unit from the following ranked categories.

Category	Description
1	Planting overhanging vegetation along the shoreline immediately landward of the OHW line in a plot 20 feet long by 10 feet wide, OR
2	Removal of 10 linear feet of hardened shoreline and planting overhanging vegetation in the removal area, OR
3	Removal of 100 square feet of existing in-water human made structures (*e.g.*, pier, piling, human-made debris, concrete, asphalt, etc.) Or an equivalent of what is being constructed (*e.g.*, proposed driving of six piles, removal of six derelict piles).

i. The mitigation plantings will include native shrubs (sitka willow (*Salix sitchensis*), scouler willow (*S. scouleriana*), sandbar willow (*S. exigua*), Mackenzie's willow (*S. prolixa*), Pacific willow (*S. lasiandra*), yellow willow (*S. lutea*), red osier dogwood (*Cornus stolonifera*)) and trees (black cottonwood (*Populus trichocarpa*) and Douglas fir (*Pseudotsuga menzieseii*). The shrubs will be planted at intervals of 10 feet on center. At least two trees will be included in each unit of mitigation planting.

ii. One hundred percent survival of all planted trees and shrubs is required during the first and second year after planting the mitigation units. During the third through fifth years after planting, 80% survival is required. Individual plants that die must be replaced with native shrubs and trees taken from the species list above.

iii. A mitigation planting and monitoring report will be due to NOAA Fisheries annually for 5 years from the date the project is permitted. The mitigation monitoring report will include written and photographic documentation on tree and shrub mortality and replanting efforts.

e. Reinitiate contact. To reinitiate consultation, contact the Habitat Conservation Division (Washington State Office) of NOAA Fisheries.

2. To implement reasonable and prudent measure No. 2 (general conditions for construction, operation, and maintenance), the COE shall ensure each of the following elements:

a. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.

b. Timing of in-water work. Work below the bankfull elevation[3] will be completed between July 1 and February 28.

c. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

d. Pollution and Erosion Control Plan. Prepare and carry out a pollution and erosion control plan to prevent pollution caused by construction operations. The plan must be available for inspection on request by COE or NOAA Fisheries.

i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.

(2) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, drilling sites, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations, staging areas, and roads being decommissioned.

(3) Practices to confine, remove and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including measures for washout facilities.

(4) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(5) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

[3] 'Bankfull elevation' means the height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such as average bank height, scour lines, and vegetation limits.

(6) Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

e. Piling installation. Install permanent pilings as follows.

i. Minimize the number and diameter of pilings, as appropriate, without reducing structural integrity.

ii. When pile drivers are used to install a pile, use the smallest driver and the minimum force necessary to complete the job. Use a vibratory hammer, whenever feasible.

f. Treated wood.

i. Projects using treated wood[4] that may contact flowing water or that will be placed over water where it will be exposed to mechanical abrasion or where leachate may enter flowing water are not authorized, except for pilings installed following NOAA Fisheries' guidelines.[5] Treated wood pilings must incorporate design features to minimize abrasion of the treated wood from vessels, floats, or other objects that may cause abrasion of the piling.

ii. Visually inspect treated wood before final placement to detect and replace wood with surface residues and/or bleeding of preservative.

g. Preconstruction activity. Complete the following actions before significant alteration of the project area.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.

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[4]'Treated wood' means lumber, pilings, and other wood products preserved with alkaline copper quaternary (ACQ), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), copper naphthenate, chromated copper arsenate (CCA), pentachlorophenol, or creosote.

[5]Letter from Steve Morris, National Marine Fisheries Service, to W.B. Paynter, Portland District, U.S. Army Corps of Engineers (December 9, 1998) (transmitting a document titled Position Document for the Use of Treated Wood in Areas within Oregon Occupied by Endangered Species Act Proposed and Listed Anadromous Fish Species, National Marine Fisheries Service, December 1998).

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[6]).

iii. Temporary erosion controls. All temporary erosion controls will be in place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

h. Heavy Equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, water body or wetland, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within 150 feet of any stream, water body or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by COE or NOAA Fisheries.

(4) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(5) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

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[6]When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

i. Site preparation. Conserve native materials for site restoration.

i. If possible, leave native materials where they are found.

ii. If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.

iii. Stockpile any large wood, native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

j. Site restoration. Prepare and carry out a site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Make the written plan available for inspection on request by the COE or NOAA Fisheries.

i. General considerations.

(1) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant each area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

3. To implement reasonable and prudent measure No. 3 (in- and overwater structures), the COE shall ensure each of the following elements:

a. General Criteria. Dock and ramp structures permitted will comply with the following:

i. Piscivorus bird deterrence. Fit all pilings, mooring buoys, and navigational aids (*e.g.*, channel markers) with devices to prevent perching by piscivorus birds.

ii. Removal of large wood debris obstructions. When floating or submerged large wood debris must be moved to allow the reasonable use of an overwater or in-water facility, ensure that the wood is returned to the water downstream where it will continue to provide aquatic habitat function.

iii. Flotation. Permanently encapsulate all synthetic flotation material to prevent breakup into small pieces and dispersal in water.

3.0 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2));

- NOAA Fisheries must provide conservation recommendations for any Federal or state action that would adversely affect EFH (section 305(b)(4)(A));

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (section 305(b)(4)(B)).

Essential fish habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA section 3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

Essential fish habitat consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of Essential Fish Habitat

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook; coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in section 1.2 and 1.3 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

3.4 Effects of Proposed Action

As described in detail in section 2.2 of this document, the proposed action may result in short- and adverse effects to a variety of habitat parameters.

1. The proposed action will result in a temporary risk of contamination of waters through the accidental spill or leakage of petroleum products from heavy equipment.

2. The proposed action will result in a short-term degradation of water quality (turbidity) because of instream construction activities.

3. The proposed action will result in a short-term generation of potentially harmful sound pressure levels associated with pile driving.

4. The proposed action will result in the long-term removal of 7 square feet of benthic habitat

5. The proposed action will 38 cubic feet of in-water structure that will likely contribute to a long-term increase in predation on coho and chinook, as well as long-term increases in freshwater exogenous material (non-native predators).

3.5 Conclusion

NOAA Fisheries concludes that the proposed action will adversely affect designated EFH for chinook and coho salmon.

3.6 Esential Fish Habitat Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the COE, and believes these measures are sufficient to minimize, to the maximum extent practicable, the following EFH effects; contamination of waters, suspended sediment, sound, benthic habitat removal, and predation. However, these conservation measures are not sufficient to fully address the remaining adverse affects to EFH. Consequently, NOAA Fisheries recommends that the COE implement the following conservation measures to minimize the potential adverse effects on EFH for chinook and coho:

1. Implement Term and Condition No. 2 as described in section 2.6.3 to minimize EFH adverse affects No. 1 thru No. 5.

2. Implement Term and Condition No. 3 as described in section 2.6.3 to minimize EFH adverse affects No. 4 and No. 5.

3.7 Statutory Response Requirement

Pursuant to the MSA (section 305(b)(4)(B)) and 50 CFR 600.920(k), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The COE must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(l)).

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